HP-Intel AI for Future Workforce Lab

Empowering Innovation Through Advanced Computing & Artificial Intelligence

AI-Powered Learning | Advanced Computing | Industry-Ready Workforce | Innovate Tomorrow

Department of Artificial Intelligence and Data Science
School of Computer Science and Engineering

About the
HP-INTEL AI FOR FUTURE WORKFORCE LAB

The HP-Intel AI for Future Workforce Lab at the School of Computer Science and Engineering serves as a state-of-the-art hub dedicated to advanced research, innovation, and experiential learning in Artificial Intelligence, High-Performance Computing, Machine Learning, and Data Analytics. The center is equipped with 21 advanced HP GPU-enabled computing systems, including 18 Standard GPU Systems with Intel Core i7 processors, 8 GB GPU memory, 16 GB RAM, and 1 TB SSD storage; 2 High-Performance Server GPU Workstations powered by Intel Xeon processors with 20 GB GPU memory and 32 GB RAM; and 1 Special Remote-Access GPU Server with 24 GB GPU memory, 128 GB RAM, and 4 TB storage for research-intensive applications.

The team behind the HP-Intel AI for Future Workforce Lab, nurturing innovation, research, and AI excellence

The infrastructure supports Artificial Intelligence, Deep Learning, Computer Vision, Data Science, Machine Learning, and interdisciplinary research activities. The HP-Intel AI for Future Workforce Lab has significantly strengthened the department's ecosystem for project-based learning, innovation-driven activities, faculty research, and industry-oriented skill development by providing students with exposure to real-world computational environments and emerging technologies.

intel
AI Skills Lab
Empowering future workforce with AI skills for employability in the digital economy
intel
Building an AI-ready Generation
This AI Skills Lab is dedicated to empower future workforce with AI Skills for employability.

The HP-AI Center of Excellence continues to serve as a catalyst for innovation, fostering a research-oriented ecosystem where students and faculty collaboratively work on impactful AI-driven solutions aligned with industry and societal needs.

Flagship Initiatives

SKILL DEVELOPMENT PROGRAMMES

I. Workshop on Introduction to AI & Generative AI

- Duration: 7th July – 16th July, 2025
- Participants: 16 Faculty Members

II. Unnati Generative AI Workshop

- Duration: 15th October – 21st October, 2025
- Participants: 16 Faculty Members

AI Research & Innovation Projects

I. SPARKX 2.0

SparkX 2.0 is a dynamic platform designed to bring together innovative minds from all years to showcase their creativity, technical skills, and problem-solving abilities.

This event provides students with the opportunity to present their projects, gain recognition, and compete for exciting prizes.

Whether a beginner with a fresh idea or an experienced developer with a fully built project, SparkX 2.0 welcomes everyone to participate and demonstrate their work.

Participants can present projects across various domains such as Software Development, Artificial Intelligence & Data Science, IoT, Game Development, and more.

II. 30-Day Agile Challenge

The programme is designed to encourage students to transform innovative ideas into practical AI-based solutions within a focused 30-day development cycle.

The challenge follows an agile and project-oriented learning approach where students work in teams under faculty mentorship to design, develop, test, and present real-world technology solutions.

Selected students are assigned AI-based problem statements from various domains such as:

- Healthcare
- Smart Cities
- Education
- Environment
- Automation
- NLP and Computer Vision

Each team is guided by faculty mentors and experts to provide technical guidance, research support, model evaluation suggestions, implementation feedback.

Out of the 25 teams that successfully completed the HP-Intel AI for Future Workforce Lab 30-Day Agile Challenge and showcased their projects at SPARKX 2.0, two teams achieved remarkable success by winning prizes in the competition. This accomplishment reflects the effectiveness of the challenge in fostering innovation, technical excellence, teamwork, and real-world problem-solving skills among students. The achievement highlights the strong mentorship, research-oriented approach, and hands-on learning ecosystem provided by the HP-Intel AI for Future Workforce Lab, motivating students to transform ideas into impactful AI-driven solutions.

Transforming ideas into success stories: HP-Intel AI for Future Workforce Lab teams recognized among the winners at SPARKX 2.0

Major Student Innovations & Outcomes

1. Student Project Management System (SPMS)

The Student Project Management System (SPMS) is an innovative web-based platform designed to streamline the complete lifecycle of student projects through a centralized digital ecosystem. Built using PHP and MySQL technologies, the platform provides a structured and role-based collaborative environment for students, mentors, and administrators.

- AI-Powered Topic Suggestions – Intelligent project recommendations aligned with students' domain interests.
- AI-Assisted Report Evaluation – Automatic analysis of progress reports with preliminary AI feedback.
- Intelligent Mentor Auto-Assignment – Smart mentor allocation based on availability and expertise.

SPMS represents a major step toward digital transformation in academic project management by replacing fragmented manual processes with an intelligent and unified management framework.

Team

- Dhruv Tripathi (B.Tech CSE 3rd Year)
- Tushar Tripathi (B.Tech CSE 3rd Year)
- **Mentored by** Mr. Rampal Singh
  Assistant Professor, SCSE

2. GConnect360 – Smart Campus Management Platform

GConnect360 is a next-generation smart university management platform designed to digitize essential campus services for students and faculty members. The system integrates multiple smart modules aimed at improving operational efficiency and enhancing campus experience.

Existing Modules

- Complaint Registration & Real-Time Tracking System
- Lost & Found Management System
- Smart Parking Management with Real-Time Slot Availability
- Vehicle Search System with Vehicle Owner Information

Planned AI-Driven Enhancements

- AI Complaint Assistant for automatic complaint categorization and department assignment
- Smart Parking Recommendation System for guiding users to the nearest available parking slot
- AI Chatbot Integration for instant student support and automated query resolution

Team

- Mohd. Rameez Ansari (B.Tech CSE 3rd Year)
- **Mentored by** Ms. Isha Chopra
  Assistant Professor, SCSE

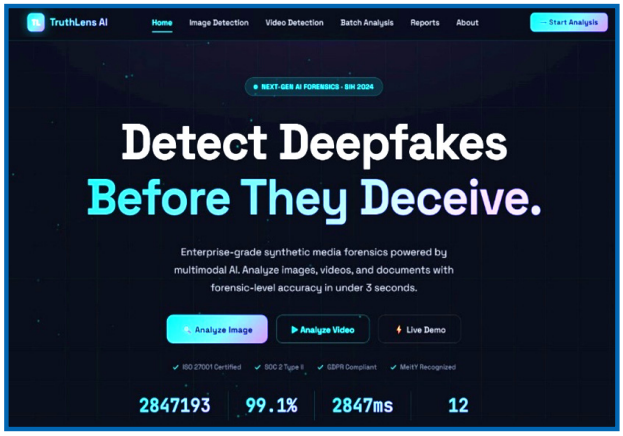
Projects Gallery

1. TruthLensAI

Team Members: Shubham Kumar Bhagat, Harish and Shivam Chauhan
B.Tech AI & Data Science (3rd Year)

Technology Stack: Next.js, TypeScript, Tailwind CSS, FastAPI, Python, Redis, Celery, PyTorch, EfficientNet-B3, Frequency CNN, OpenCV, PostgreSQL, Docker, GitHub, and AWS for scalable AI-powered deepfake detection and media authenticity verification.

Impact: Enhances digital trust and security through AI-powered deepfake detection, helping individuals and organizations identify manipulated media with confidence.

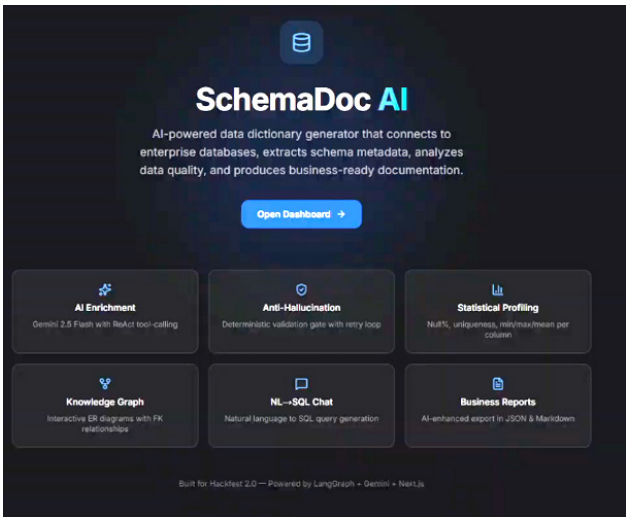


2. SchemaDoc AI

Team Members: Mohd Aafi, Rahul Kumar
B.Tech Data Science (3rd Year)

Technology Stack: Built using LangGraph, FastAPI, and Next.js to deliver intelligent AI agent workflows through a scalable cloud-native architecture.

Impact: SchemaDoc AI eliminates the manual, error-prone process of managing outdated schemas by instantly transforming enterprise databases into accurate, AI-enriched, and business-ready data dictionaries. By automating extraction, quality scoring, and validation, it saves analysts countless hours while ensuring zero data loss and zero hallucinations.

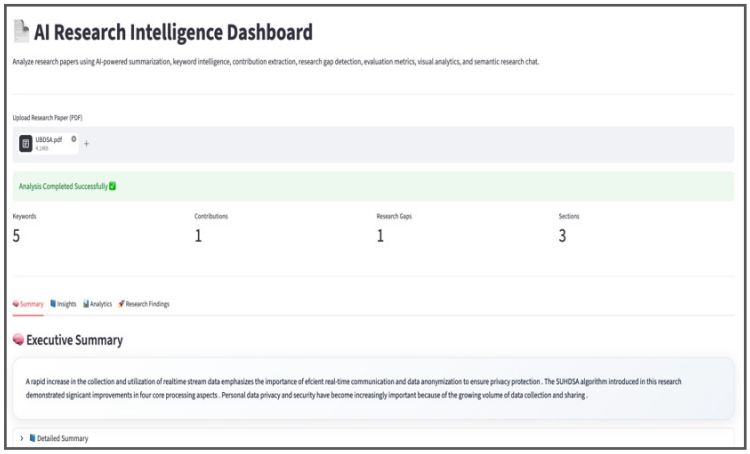

SchemaDoc AI
AI-powered data dictionary generator that connects to enterprise databases, extracts schema metadata, analyzes data quality, and produces business-ready documentation.
Open Dashboard →
AI Enrichment
Gemini 2.5 Flash with ReAct tool-calling
Anti-Hallucination
Deterministic validation gate with retry loop
Statistical Profiling
Null%, uniqueness, min/max/mean per column
Knowledge Graph
Interactive ER diagrams with FK relationships
NL→SQL Chat
Natural language to SQL query generation
Business Reports
AI-enhanced export in JSON & Markdown
Built for Hackfest 2.0 — Powered by LangGraph + Gemini + Next.js

3. AI Research Intelligence Dashboard

Team Member: Yashashwi Singh
B.Tech CSE (3rd Year)

Technology Stack: Streamlit, FastAPI, Uvicorn, Pydantic, pdfminer.six, PyMuPDF, Hugging Face Transformers, BART-Large-CNN, Phi-3-Mini, Ollama/vLLM, scikit-learn, and pytest for document processing, summarization, evaluation, and deployment.

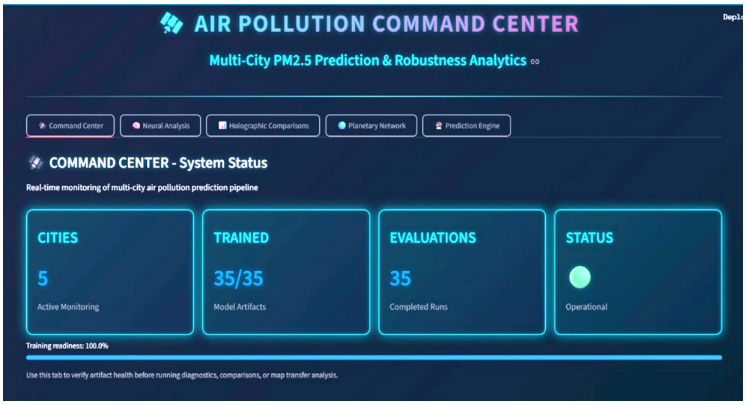
Impact: Empowers researchers with AI-driven summarization, accelerating literature review, knowledge discovery, and research decision-making.


AI Research Intelligence Dashboard
Analyze research papers using AI-powered summarization, keyword intelligence, contribution extraction, research gap detection, evaluation metrics, visual analytics, and semantic research chat.
Upload Research Paper (PDF)
UBDSA.pdf
Analysis Completed Successfully
Keywords
5
Contributions
1
Research Gaps
1
Sections
3
Summary
Insights
Analytics
Research Findings
Executive Summary
A rapid increase in the collection and utilization of realtime stream data emphasizes the importance of efcient real-time communication and data anonymization to ensure privacy protection . The SUHDSA algorithm introduced in this research demonstrated signicant improvements in four core processing aspects . Personal data privacy and security have become increasingly important because of the growing volume of data collection and sharing .
Detailed Summary

Projects Gallery

4. Air Pollution Command Center

Team Members: Ranvijay Kumar, B.Tech Data Science (2nd Year) and Sudarshan Prasad, B.Tech CSE (2nd Year)

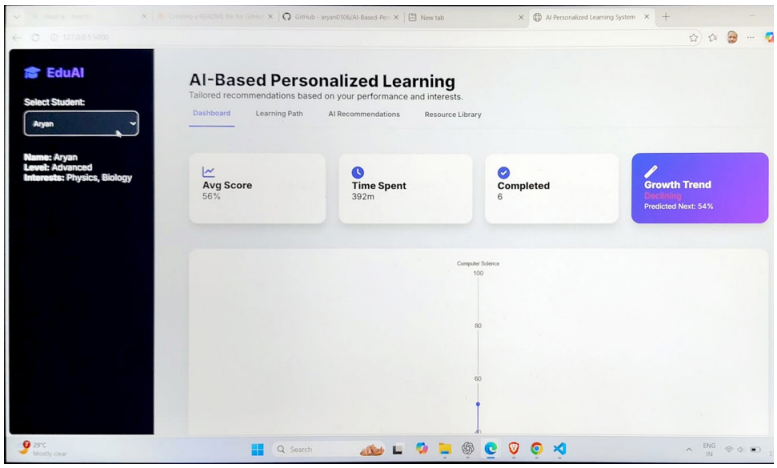


Technology Stack: Python, FastAPI, Streamlit, React, Next.js, Scikit-Learn, XGBoost, LightGBM, TensorFlow/Keras, Pandas, NumPy, Plotly, PyArrow, and cloud-deployable APIs for real-time air quality forecasting and analytics.

Impact: Empowering smarter cities through AI-driven air quality forecasting for healthier communities and proactive environmental management

5. AI Based Personalized Recommendations Learning System

Team Members: Aryan Singh, Himanshu Yadav and Ayush Kumar Jha
B.Tech CSE (Data Science 2nd Year)

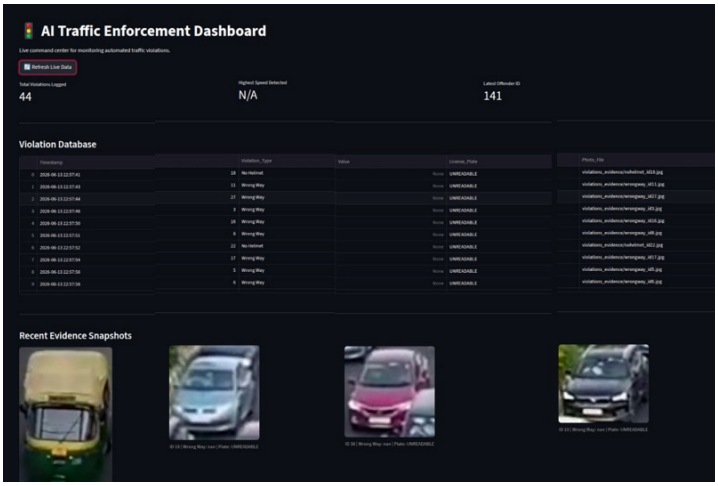


Technology: Python, HTML, JavaScript, CSS

Impact: It can improve learner outcomes by delivering targeted content and adaptive learning paths, give teachers actionable analytics for targeted interventions, and be productized for institutional use, but its impact depends on data quality, privacy safeguards, and moving from CSVs to a scalable data store to avoid bias, compliance, and scalability issues.

6. AI based Traffic Enforcement

Team Members: Piyush Kumar, Md. Farhan Ali, Yoganshu Chauhan and Piyush Jha
B.Tech CSE (3rd Year)



Technology Stack: Python, OpenCV, YOLOv8, ByteTrack (for tracking), EasyOCR (for license plates), the threading library, and the Telegram API.

Impact: Covers cost-effective scalability (software over hardware), eliminating human fatigue, instant response times, data-driven urban planning, and optimizing police resources

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